Rehabilitation of the Blue Ridge Parkway with FDR and AC Overlay

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HISTORY

- Existing pavement on Parkway very deteriorated
- Repair options were heavy patching and overlay or FDR with AC overlay
- Past FDR projects had issues, were less than successful
- Two alternatives were bid
- FDR option was low bid on contracts 1B6 & 1C4

Existing Road Structure

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TEST PIT SAMPLES

- 18” x 36” at design depths
- A minimum of 1 sample per road mile
- From the time the samples are taken and tested and the mix design submitted for approval is about 85 days

TEST PIT SAMPLES

TEST PIT SAMPLES

BEFORE CONSTRUCTION BEGINS

- Any necessary Full Depth Patching is completed
- Existing lane slopes are taken every 100’
- Existing roadway widths are measured
- Slopes and widths are used to maintain control and ensure the roadway is as close as feasible to existing conditions

PRE-CUTTING

- Pre-cutting is performed to get the roadway components mixed together as a single unit
- It allows the cement to be mixed in to design depths and gives a uniform more stable product
- The re-claimer makes 2 passes over the lane width, it is rolled by sheeps foot roller, graded and smooth drum rolled, no tests are taken

PRE-CUTTING cont'd

- Traffic is allowed on the pre-cut surface immediately
- The adjoining lane follows the same pre-cut process

PRE-CUTTING

PRE-CUTTING

SPREADING CEMENT

- The center and edge lines are painted to identify the area to be treated
- Cement is spread evenly over the width of the lane to be treated
- If the cement is not spread evenly it will affect the compressive strength test results

SPREADING CEMENT

TREATMENT

- A water truck is attached to the re-claimer to inject moisture into the roadway as the treatment process begins
- The re-claimer will make 2 passes per lane with an overlap in the center of the lane
- When the re-claimer begins the second pass the sheeps-foot roller begins compacting the material

TREATMENT

TREATMENT


NOTICE
NON-POTABLE WATER
NOT FOR DRINKING
OR COOKING USE
08/06/2014 10:52

SHEEP'S FOOT ROLLER

TREATMENT cont'd

- The center and edge lines are marked and the grade work begins on the roadway
- The center and edge lines are remarked after every grader pass
- Grading is the most important operation during the treatment process, the fewer passes it makes the better the finished product will be

MOTOR GRADER

WINDROWED MATERIAL

TREATMENT cont'd

- 6 passes or less is optimal to prevent segregation of the materials however more passes may be needed
- Compressive strength test pills are made at this juncture in the process
- The smooth drum roller completes the treatment phase
- Nuclear gauge tests are taken

TREATMENT cont'd

- The area must be maintained at or near optimum moisture during the treatment phase
- After a varying period of time traffic is allowed to run on the area while the adjacent lane is going through the treatment process
- The contractor determines the switch time since they are responsible for the product until the next lift is placed

TREATMENT cont'd

- The contractor will perform their own QC checks during this time, determine any deficiencies, make the necessary repairs and keep the treated areas wet as needed
- The treated area cures for a minimum of 24 hours before paving operations can begin

QC ACCEPTANCE CHECK

- After the minimum cure period of 24 hours the area to be paved is checked by the agency, prime and FDR sub-contractor, and the paving company to determine if the area is in spec and ready to be paved
- Any identified deficiencies during this check must be corrected by the FDR contractor before paving can begin

QC ACCEPTANCE CHECK cont'd

- The area is checked with a straight edge to ensure the contractor has "produced a surface that is smooth, dense, free of compaction planes, ridges or loose material" as well as no soft or wet spots are present
- When the area has been approved it is wet again and asphalt placement can begin

QC ACCEPTANCE CHECKS

TESTING

- Current ASTM Standard calls for 1 - 4” diameter pill to be made per day of treatment
- The nominal size of the material after treatment is 1.5”
- After test results with a wide range of numbers FHWA suggested that 4 - 6” pills be made and the break results averaged together for that days official test result

TESTING cont'd

- After some initial hesitation, understandably, to do so due to the additional associated costs the Contractor agreed to try the suggestion
- The break numbers fell in line with the specifications and were consistent throughout the remainder of the project
- The nuclear gauge tests were consistently at or above the requirements

LESSONS LEARNED/KEYS TO SUCCESS

- Pre-cutting the area before treating
- Even spread of cement
- Maintain control through slopes and roadway widths
- Maintaining control as listed above limits excess material needing removal from the roadside after treatment
- At 8” depth the treated roadway will bridge sub base failures except for extreme cases

KEYS TO SUCCESS

- When a problem arises the ability to think “outside the box” for an viable solution to the problem
- What is written in a spec may need to be changed to achieve a successful product
- The Contractor must be willing to spend some additional time or money, within reason, if needed

KEYS TO SUCCESS cont'd

- Owner/client must train field personnel to determine solutions
- Contractors must be committed to performing the work at the necessary QC levels and train their workers to do so as well
- All parties performing their roles to the best of their abilities will be the key to future FDR work

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